



GAMMA SCIENTIFIC *Light Measurement Solutions*



GS-1290 Display Measurement Systems



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About Gamma Scientific

Since 1961 Gamma Scientific has produced LED, display and light measurement test solutions for production and R&D environments. Gamma Scientific instruments are trusted by leading global organizations that require high-speed, precision measurements and custom configurations for the most challenging environments. Gamma Scientific also operates a NVLAP accredited laboratory that performs LM-79/ LM-80 LED testing and is ISO 17025 compliant. NVLAP Lab Code 200823-0.

To view the complete line of test and measurement solutions from Gamma Scientific, please visit our website at www.gamma-sci.com.

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With over 50 years of experience in developing commercial light measurement instruments, **Gamma Scientific is trusted by the world's leading organizations to provide accurate and repeatable test systems.**

The Gamma Scientific GS-1290 series of [display measurement spectroradiometers](#) represent the state-of-the-art in speed and accuracy in a commercially available instrument.

The GS-1290 offers the highest dynamic range in an array-type spectroradiometer available, now achieving 1,000,000:1 contrast measurements for a single measurement aperture, as well as extremely good sensitivity, with luminance measurements down to 0.0005 cd/m².

Spectral measurements of displays can be repeatedly taken in milliseconds with ultra-low uncertainty. In addition, any application that demands high sensitivity in the blue-light region, for example LED backlit **displays, will benefit from this system's back-thinned CCD technology** – its sensitivity is at least two times greater than front-illuminated CCD-based systems.

The optical viewing system utilizes the Gamma Scientific AVS Cam – an optical system that back projects the measurement aperture, superimposing the measurement spot on the DUT, which is both visible on the DUT or on the host computer via a USB 2.0 camera. A Reflex Viewing System is also available.





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FEATURES

- Luminance measurements down to 0.0005 cd/m²
- Contrast measurements to 1,000,000:1
- Superior wavelength and color accuracy via low thermal expansion coefficient materials
- Near-real-time measurement
- High resolution: 0.4 nm/pixel
- Spectral ranges: 310-930 nm, 350-1100 nm, and 360-800 nm
- Low polarization error
- User-selectable half power bandwidth
- Six different measurement apertures
- AVS Viewing System or Reflex Viewing System
- USB interface
- Windows-based control/analysis software
- NIST-traceable accuracy
- Self-calibrated, system never has to be returned to lab for calibration





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Detector and Wavelength Specifications

Model Number	GS-1290-DMS-1	GS-1290-DMS-2	GS-1290-DMS-3
Spectral Range (nominal)	360-930 nm	360-1100 nm	360-800 nm
	310-930 nm with quartz optics	350-1100 nm with quartz optics	
Wavelength Resolution	0.6 nm/element	0.9 nm/element	0.4 nm/element
Spectral Bandwidth	Built-In User Selectable Half-Power Bandwidth (HPBW) Bold is factory setting		
	10 nm	20 nm	10 nm
	5.0 nm	10 nm	5.0 nm
	2.5 nm	5.0 nm	2.5 nm
	1.8 nm	2.7 nm	1.4 nm
	1.2 nm	1.8 nm	1.0 nm
Wavelength Repeatability	0.02 nm	0.03 nm	0.02 nm
Wavelength Accuracy	+/- 0.25 nm	+/- 0.25 nm	+/- 0.25 nm
Stray Light	Less than 1×10^{-4} (at 8 times the HPBW from a HeNe laser line)		
Polarization Error ¹	< 1%		
Measuring Angle	5°, 2°, 1°, 0.5°, 0.3°, or 0.1° (user-selectable)		
Min. measuring distance	69 mm with macro lens. Single calibration valid from 100 mm to infinity.		
Integration Time	0.008 to 520 seconds		
Computer Interface	USB 2.0		
Control Software	Analysis in CIE1931 XYZ and xy; CIE1976 UCS u'v'; CIE1976 L*u*v* and L*a*b*; CIE 1964 XYZ		
Operating Temp / Humidity	5 to 35°C / relative humidity 0 to 90%, non-condensing		
Size	12.1" L x 6" W x 11.8" H (30.8 cm L x 15.1 cm W x 29.9 cm H)		
Weight	20 lbs. (9.1 kg)		
Power	AC Adapter (100-240 V~, 50-60 Hz)		

1: Measuring 100% linearly polarized light through a Glan-Thompson Prism

2: Sensitivities are for a 10:1 signal-to-noise ratio based on the percent coefficient of variance measuring the luminance of a CIE Illuminant A source.

3: Standard Operating Range for Gamma Scientific Instruments- Temperature: Minimum: 0°C (32°F) - Maximum: 35°C (95°F); Relative Humidity (Non-Condensing): Minimum: 20% - Maximum 70%

4: The information contained in this data sheet is based on Gamma Scientific's internal evaluation and is subject to change at any time without notice.

5: Revised on April 9, 2015



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Sensitivity and Accuracy Chart²

Aperture Size	5°	2°	1°	0.5°	0.33°	0.1°
Sensitivity (cd/m²)	0.00015 to 36,500	0.00022 to 53,600	0.0009 to 220,000	0.0034 to 829,000	0.016 to 3,900,000	0.09 to 21,900,000
Chromaticity Accuracy (GS-1290-DMS-1)	x,y: ±0.0020 (0.0015-0.05 cd/m ²)	x,y: ±0.0025 (0.002-0.07 cd/m ²)	x,y: ±0.0025 (0.009-0.3 cd/m ²)	x,y: ±0.0025 (0.03-1.1 cd/m ²)	x,y: ±0.0025 (0.16-5.1 cd/m ²)	x,y: ±0.0025 (0.9-29 cd/m ²)
	x,y: ±0.0015 (0.05-800 cd/m ²)	x,y: ±0.0015 (0.07-1,150 cd/m ²)	x,y: ±0.0015 (0.3-4,700 cd/m ²)	x,y: ±0.0015 (1.1-17,750 cd/m ²)	x,y: ±0.0015 (5.1-83,500 cd/m ²)	x,y: ±0.0015 (29-470,000 cd/m ²)
	x: ±0.0015 y: ±0.001 (800-36,500 cd/m ²)	x: ±0.0015 y: ±0.001 (1,150-53,600 cd/m ²)	x: ±0.0015 y: ±0.001 (4,700-220,000 cd/m ²)	x: ±0.0015 y: ±0.001 (17,750-829,000 cd/m ²)	x: ±0.0015 y: ±0.001 (83,500-3.9M cd/m ²)	x: ±0.0015 y: ±0.001 (470,000-21.9M cd/m ²)
Chromaticity Accuracy (GS-1290-DMS-2)	x,y: ±0.0040 (0.0015-0.05 cd/m ²)	x,y: ±0.0050 (0.002-0.07 cd/m ²)	x,y: ±0.0050 (0.009-0.3 cd/m ²)	x,y: ±0.0050 (0.03-1.1 cd/m ²)	x,y: ±0.0050 (0.16-5.1 cd/m ²)	x,y: ±0.0050 (0.9-29 cd/m ²)
	x,y: ±0.0030 (0.05-800 cd/m ²)	x,y: ±0.0030 (0.07-1,150 cd/m ²)	x,y: ±0.0030 (0.3-4,700 cd/m ²)	x,y: ±0.0030 (1.1-17,750 cd/m ²)	x,y: ±0.0030 (5.1-83,500 cd/m ²)	x,y: ±0.0030 (29-470,000 cd/m ²)
	x: ±0.0030 y: ±0.002 (800-36,500 cd/m ²)	x: ±0.0030 y: ±0.002 (1,150-53,600 cd/m ²)	x: ±0.0030 y: ±0.002 (4,700-220,000 cd/m ²)	x: ±0.0030 y: ±0.002 (17,750-829,000 cd/m ²)	x: ±0.0030 y: ±0.002 (83,500-3.9M cd/m ²)	x: ±0.0030 y: ±0.002 (470,000-21.9M cd/m ²)
Chromaticity Accuracy (GS-1290-DMS-3)	x,y: ±0.0020 (0.0015-0.05 cd/m ²)	x,y: ±0.0025 (0.002-0.07 cd/m ²)	x,y: ±0.0025 (0.009-0.3 cd/m ²)	x,y: ±0.0025 (0.03-1.1 cd/m ²)	x,y: ±0.0025 (0.16-5.1 cd/m ²)	x,y: ±0.0025 (0.9-29 cd/m ²)
	x,y: ±0.0015 (0.05-800 cd/m ²)	x,y: ±0.0015 (0.07-1,150 cd/m ²)	x,y: ±0.0015 (0.3-4,700 cd/m ²)	x,y: ±0.0015 (1.1-17,750 cd/m ²)	x,y: ±0.0015 (5.1-83,500 cd/m ²)	x,y: ±0.0015 (29-470,000 cd/m ²)
	x: ±0.0015 y: ±0.001 (800-36,500 cd/m ²)	x: ±0.0015 y: ±0.001 (1,150-53,600 cd/m ²)	x: ±0.0015 y: ±0.001 (4,700-220,000 cd/m ²)	x: ±0.0015 y: ±0.001 (17,750-829,000 cd/m ²)	x: ±0.0015 y: ±0.001 (83,500-3.9M cd/m ²)	x: ±0.0015 y: ±0.001 (470,000-21.9M cd/m ²)
Canon 50 mm Compact Macro 1:2.5						
Measurement Spot Size @ 69 mm (2.72")	ø 9.83 mm (0.387")	ø 3.93 mm (0.155")	ø 1.97 mm (0.077")	ø 0.98 mm (0.039")	ø 0.65 mm (0.026")	ø 0.20 mm (0.008")
Measurement Spot Size @ 100 mm (3.94")	ø 10.49 mm (0.413")	ø 4.20 mm (0.165")	ø 2.10 mm (0.083")	ø 1.05 mm (0.041")	ø 0.69 mm (0.027")	ø 0.21 mm (0.008")
Measurement Spot Size @ 279 mm (11")	ø 28.26 mm (1.113")	ø 11.30 mm (0.445")	ø 5.65 mm (0.223")	ø 2.83 mm (0.111")	ø 1.86 mm (0.073")	ø 0.57 mm (0.022")
Canon 50mm Compact Macro 1:2.5 with Life-size Converter EF; MAG = 1.46						
Measurement Spot Size @ 69 mm (2.72")	ø 4.83 mm (0.190")	ø 1.93 mm (0.076")	ø 0.97 mm (0.038")	ø 0.48 mm (0.019")	ø 0.32 mm (0.013")	ø 0.10 mm (0.004")
Measurement Spot Size @ 100 mm (3.94")	ø 6.86 mm (0.270")	ø 2.74 mm (0.108")	ø 1.37 mm (0.054")	ø 0.69 mm (0.027")	ø 0.45 mm (0.018")	ø 0.14 mm (0.005")
Measurement Spot Size @ 279 mm (11")	ø 19.37 mm (0.763")	ø 7.75 mm (0.305")	ø 3.87 mm (0.153")	ø 1.94 mm (0.076")	ø 1.28 mm (0.050")	ø 0.39 mm (0.015")
Tamron 180 mm Macro 1:3.5						
Measurement Spot Size @ 279 mm (11")	ø 10.49 mm (0.413")	ø 4.20 mm (0.165")	ø 2.10 mm (0.083")	ø 1.05 mm (0.041")	ø 0.69 mm (0.027")	ø 0.21 mm (0.008")

1: Measuring 100% linearly polarized light through a Glan-Thompson Prism

2: Sensitivities are for a 10:1 signal-to-noise ratio based on the percent coefficient of variance measuring the luminance of a CIE Illuminant A source.

3: The information contained in this data sheet is based on Gamma Scientific's internal evaluation and is subject to change at any time without notice.